

CYTOGENETIC ANALYSIS OF CHERNOBYL CLEAN UP WORKERS AS MEASURED BY CHROMOSOME PAINTING.

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The Chernobyl reactor accident in 1986 was the largest non-military single release of radioactivity in history. This tragedy provided an opportunity to study low dose chronic (or sub-acute) ionizing radiation exposures to a large population. Soviet citizens were sent to the site of the accident to contain and clean up the radioactive contamination. Their exposure to radiation was intended to be low, usually between 5 and 25cGy. As part of a large Program Project examining biological effects on these individuals, we are performing chromosome painting of metaphase lymphocytes to quantify the frequencies of stable aberrations (translocations and insertions). To date, we have analyzed samples from 253 subjects by painting chromosomes 1, 2 and 4 simultaneously and examining a minimum of 500 cell equivalents per subject. Age and smoking status are available at this time for 161 (46 controls and 115 clean up workers) of the 253 subjects. Our data indicate a highly significant difference in frequency of stable aberrations between controls and exposed workers ($p=0.0007$) demonstrating a possible effect of radiation. A strong age effect is also seen ($p=0.0001$) which agrees with our previous work on an American population. If we include smoking as a bivariate factor (yes or no), the analyzable data set is reduced to 111 subjects, and we find that smoking also shows a significant effect ($p=0.029$). This work was performed in part under the auspices of the US DOE by LLNL under contract No. W7405-ENG-48.